Claim 1 is directed to a process for manufacturing a cellulosic paper product and requires forming an aqueous suspension of papermaking fibers; depositing the aqueous suspension of papermaking fibers onto a sheet-forming fabric to form a wet web; dewatering the wet web to form a partially dewatered web; topically applying a glycol compound selected from a group consisting of polyethylene glycol, triethylene glycol, glycerol and mixtures thereof to the partially dewatered web having a fiber consistency of about 80% or less; and drying the partially dewatered web by passing heated air at a temperature of at least about 175°C through the web.

Vinson et al. disclose a softening composition for absorbent tissues. The composition contains a softening active ingredient, a vehicle in which the softening active ingredient is dispersed and an electrolyte dissolved in the vehicle. The softening active ingredient is suitably a quaternary ammonium compound which is preferably accompanied by an appropriate plasticizer including, for example, glycerol and polyethylene glycol having a molecular weight of from about 200 to about 2000, with polyethylene glycol (PEG) having a molecular weight of from about 200 to about 600 being particularly preferred. The function of the plasticizer is to reduce the melting point and viscosity of the quaternary ammonium ingredient to aid in the synthesis (See col. 13, lines 19-42). The disclosed softening composition including a plasticizer may be applied to a "dry" tissue web, including "overdried" tissue webs, or to a "semi-dry" tissue web (See col. 4, lines 56-58). In a preferred embodiment, the softening composition is applied to a dried or overdried tissue web shortly after it is separated from the drying means and before it is wound onto a parent roll (See col. 5, lines 48-51; col. 18, lines 24-33; and Fig. 1). Alternatively, the softening composition may be applied to a semi-dry tissue web such as while

the web is on the forming wire or Fourdrinier cloth, on a drying felt or fabric, or while the web is in contact with the Yankee dryer or other alternative drying means (See col. 5, lines 51-55). Vinson et al. define a **"dry"** or **"overdried"** tissue web as a web dried to a moisture content at or below its equilibrium moisture content at standard conditions of 23°C and 50% relative humidity (See col. 4, lines 59-63; and col. 5, lines 22-26). A **"semi-dry"** tissue web includes a web with a moisture content exceeding its equilibrium moisture content (See col. 4, lines 63-65). The equilibrium moisture content of a tissue web at standard conditions is said to be approximately 7% (See col. 5, lines 26-28). The tissue web of Vinson et al. may be dried or overdried using a Yankee dryer or by through-air drying (See col. 5, lines 28-35).

As stated in Amendment A filed on June 16, 2003 and again on February 18, 2004, Vinson et al. fail to disclose the requirement of drying the partially dewatered web of papermaking fibers by passing heated air **at a temperature of at least 175°C** through the web. While drying the tissue web by through-air drying is mentioned, the reference does not disclose any details as to how such a through-air drying step is conducted, including the temperature of the heated air passed through the web. The only drying temperatures disclosed by Vinson et al. are in Examples 1-3 and **are for a Yankee dryer.** A Yankee dryer is distinguished from through-air drying as it does not involve passing heated air through the web, but instead heats the web as it passes over a steam-heated cylinder.

Vinson et al. also fail to disclose applying a polyhydroxy compound, such as glycerol and polyethylene glycol, to a partially dewatered web **having a fiber consistency of about 80% or less.** Instead, as noted above, Vinson et al. prefer to apply the softening composition to a dry or overdried web defined as

having a moisture content of 7% or less and **corresponding to a fiber consistency of 93% or greater.** In each of the Examples, the softening composition containing PEG 400 was applied to the web after the fiber consistency was increased to at least 96% on a Yankee dryer (See Example 1 at col. 21, line 64 to col. 22, line 12; Example 2 at col. 23, line 65 to col. 24, line 9; and Example 3 at col. 25, line 62 to col. 26, line 11). Furthermore, although Vinson et al. disclose that the softening composition may be applied to a semi-dry web, a semi-dry web is defined as having a moisture content in excess of 7% (i.e., its equilibrium moisture content at standard conditions) and **corresponding to a fiber consistency of up to 93%.** The remainder of the disclosure, including the working Examples, does not illustrate application of the softening composition to a semi-dry web, nor more importantly, application of the softening composition to a partially dewatered web of papermaking fibers having a fiber consistency of about 80% or less as required in claim 1.

Recognizing that Vinson et al. fail to disclose features recited in the process defined in claim 1, the Office cites the Soerens and Smook references for combination with the Vinson et al. reference in an attempt to find each and every element of Applicants' claim 1.

Soerens discloses a polymer-polymer adhesive-complex for enhancing the adhesion of a paper web to a creping cylinder, such as a Yankee dryer. The adhesive-complex is formed from at least two separately applied water-soluble polymeric components. The water-soluble polymeric component is preferably an aqueous solution of a polyether, a polyamide, or a mixture of one or both with another water-soluble polymer. Preferred polymer components include polyethylene oxide, polypropylene oxide, ethyleneoxide/propylene oxide copolymers, polytetra methylene oxide, poly vinyl methyl ether, and the like. (See col. 2, lines

53-60). Soerens, additionally, discloses spraying the paper web with an aqueous solution of one water-soluble polymeric component of the adhesive complex prior to being adhered to the creping cylinder or Yankee dryer. (See col. 3, lines 26-29).

Generally, Smook discloses the paper drying process. Specifically, the reference discloses the process of passing a wet web from the press section of a dryer containing 55-60% moisture (40-45% dryness) over a series of rotating steam-heated cylinders where water is evaporated and carried away by ventilation air. (See page 265).

In order for the Office to show a *prima facie* case of obviousness, M.P.E.P. § 2143 requires that the Office meet three criteria: (1) the prior art reference(s) must teach or suggest all of the claim limitations; (2) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; and (3) there must be some reasonable expectation of success. Applicants assert that the Office has not, and cannot, meet the burden of number (1) and/or (2) above, which requires the Office to show the references, when combined, teach or suggest all of the claim limitations of the instant invention and that there is some suggestion or motivation to combine the reference teachings.

As discussed above, Vinson et al. fail to disclose applying a glycol compound to a partially dewatered web having a fiber consistency of about 80% or less and also fail to teach drying a partially dewatered web of papermaking fibers by passing heated air at a temperature of at least 175°C through the web as required in claim 1. The Soerens and Smook references fail to overcoming these shortcomings.

As noted above with the Vinson et al. reference, both the Soerens and Smook references fail to teach the drying of a partially dewatered web by passing heated air at a temperature of at least about 175°C through the web as required by Applicants' invention. Soerens sole method of drying the dewatered web is by pressing the web onto a Yankee dryer. There is no teaching or suggestion that any other method of drying would or could be used. Specifically, the major objective of the invention in the Soerens reference is enhancing the adherence of a paper web to a creping cylinder, like that used in a Yankee dryer.

Additionally, Smook discloses drying a paper web with the use of a series of rotating steam-heated cylinders which evaporate the water in the web. This is essentially a Yankee dryer. As defined above, a Yankee dryer functions by heating the web as it passes over a steam-heated cylinder. As such, there is no teaching or suggestion of a through-air drying step at a temperature of at least about 175°C.

Furthermore, there is no motivation to combine the references as none of the cited art teach or suggest the benefits achieved by the combination of applying a glycol compound to the partially dewatered web and conducting a through-air drying operation at air temperatures of at least about 175°C. The present invention provides for shorter dryer residence times and increased productivity by allowing operation of the through-drying step at these elevated temperatures, while significantly reducing malodor produced upon re-wetting the dried base sheets or finished cellulosic paper products made from the base sheets. The use of a polyhydroxy compound in the softening composition of Vinson et al. is to serve as a viscosity reducer and has nothing to do with reducing malodors generated upon re-wetting of a paper product through-air dried at elevated temperatures. Further, Soerens and Smook fail to teach or suggest reducing malodors

generated upon re-wetting of a paper product through-air dried at elevated temperatures. Accordingly, one skilled in the art upon reading the cited references would have no basis to realize that the inclusion of a glycol compound in the softening composition of Vinson et al. would inhibit the production of malodors and allow for through-air drying at temperatures of at least about 175°C.

As such, nothing in the cited art would have motivated one skilled in the art to apply a glycol compound to a partially dewatered web having a fiber consistency of about 80% or less and then through-air dry the paper web at a temperature of at least about 175°C to dry the web. Thus, claim 1 is patentable over the cited references.

Claims 2-3, 8-9, and 12 depend from claim 1 and thus are patentable for the same reasons as claim 1 set forth above, as well as for the additional elements they require.

2. Rejection of Claims 4-5, 13-16 and 24 Under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 4-5, 13-16 and 24 under 35 U.S.C. §103(a) as being unpatentable over Vinson et al. in view of Soerens and further in view of Kohler et al. (WO 01/18310).

Claim 4 is dependent upon claim 1 and further requires the glycol compound to be applied topically in an add-on amount of about 0.5 to about 20% by weight of the papermaking fibers in the partially dewatered web. Claim 1 is patentable for the reasons set forth above. Claim 1 has not been rejected under 35 U.S.C. §103(a) over Vinson et al. in view of Soerens and further in view of Kohler et al. Therefore, claim 4, which depends from claim 1, is patentable for the same reasons as claim 1 above. In particular, the cited art fails to disclose through-air drying

the web at a temperature of at least about 175%. Claim 5 depends indirectly from claim 1 and is patentable for the same reasons as claim 1, as well as for the additional elements it requires.

Furthermore, as noted below with respect to claim 13, Kohler et al. fail to disclose the range of polyethylene glycol addition recited in claims 4 and 5. Accordingly, Applicants respectfully submit that claims 4 and 5 are patentable over Vinson et al. in view of Soerens and further in view of Kohler et al.

Claim 13 is directed to a process for manufacturing a cellulosic paper product and requires forming an aqueous suspension of papermaking fibers; depositing the aqueous suspension of papermaking fibers onto a sheet-forming fabric to form a wet web; dewatering the wet web to produce a partially dewatered web having a fiber consistency of about 80% or less; topically applying a glycol compound selected from the group consisting of polyethylene glycol, triethylene glycol, glycerol and mixtures thereof to the partially dewatered web; and drying the partially dewatered web. Unlike claim 1, claim 13 does not require through-air drying by passing heated air at a temperature of at least about 175°C through the web. However, claim 13 includes the further limitation that the glycol compound be applied to the partially dewatered web in an **add-on amount ranging from about 0.5% to about 20% by weight** of papermaking fibers in the web.

Vinson et al. and Soerens are discussed above.

Kohler et al. disclose a process for improving the surface characteristics (e.g., strength, brightness and aging resistance) of a paper or board by applying an aqueous solution (L_w) of a surface-finishing active ingredient (W) to a hydrophilic paper or board sheet. The surface-finishing active ingredient includes polyethylene glycol (W_1) having an average molecular weight greater than 1500 present in the solution at a concentration of

up to 50% by weight, preferably from 0.1 to 20% by weight. The aqueous solution of polyethylene glycol is applied by spraying the aqueous solution onto the surface of the paper or board sheet to be treated in a section of the papermaking process in which the paper or board sheet has a moisture content ≤ 40%, corresponding to a fiber consistency of ≥ 60% (See page 13, lines 12-15). In all of the Examples, Solutions 1-7 containing polyethylene glycol were applied to dry paper. Preferably, the application rate of the solution is such that the concentration of the polyethylene glycol based on the dry substrate is in the range of from 0.005 g/m^2 to 5 g/m^2.

Contrary to the assertion in the Office action, Kohler et al. fail to teach the addition of polyethylene glycol to a partially dewatered web in an add-on amount ranging from about 0.5% to about 20% by weight of papermaking fibers in the web as required in claim 13. On page 4 of the Office action, the Examiner states that Kohler et al. disclose adding polyethylene glycol in amounts ranging from about 0.3% (referring to Example 2 at page 21 of Kohler et al.) to about 14% (referring to Example 1 at page 19 of Kohler et al.). The 0.3% polyethylene glycol added in Example 2 relied on by the Examiner is based on the weight of fiber material (See page 21, line 8-9), the same basis used in claim 13. However, the upper end of the range of 14% from Example 1 relied on by the Examiner is clearly described as the moistening of the paper as a result of spraying the aqueous solution (Solution I) containing polyethylene glycol **and water** (See page 19, line 18), and not the amount of polyethylene glycol alone. At page 20, line 2, Kohler et al. teach that the moistening of 14% relied on by the Examiner corresponds to an application of polyethylene glycol of **0.2%** by weight based on the fiber material. This correspondence is calculated by multiplying the application rate of Solution I (1.12 g/m^2) by the weight

concentration of polyethylene glycol in Solution I (10%) and dividing by the basis weight of the paper (56 g/m^2). Similarly, none of the remaining Examples 3-8 discloses addition of polyethylene glycol in an amount greater than 0.3% by weight based on the fiber material. For example, Example 8 includes polyethylene glycol addition of 0.15% by weight of fiber material. (See page 25, lines 3-4). Example 9 does not disclose the addition of polyethylene glycol in terms of the fiber material and fails to disclose information sufficient to make such a calculation. Thus, Kohler et al. fail to teach or suggest limitations of claim 13, including topically applying a glycol compound to a partially dewatered web having a fiber consistency of about 80% or less and applying the glycol compound in an add-on amount of from about 0.5% to about 20% by weight of the papermaking fibers in the web.

As noted above, neither Vinson et al. nor Soerens disclose the requirements of applying a glycol compound to a partially dewatered web having a fiber consistency of about 80% or less and that the glycol compound is applied in an add-on amount of from about 0.5% to about 20% by weight of the papermaking fibers in the web. Additionally, as noted above, Kohler et al. also fail to disclose topically applying a glycol compound to a partially dewatered web having a fiber consistency of about 80% or less and applying the glycol compound in an add-on amount of from about 0.5% to about 20% by weight of the papermaking fibers in the web. As such, Applicants respectfully submit that these references, either singly or when combined, do not teach or suggest each and every limitation recited in claim 13 as required for a *prima facie* case of obviousness under MPEP § 2143.

Furthermore, the asserted justification for combining Vinson et al. and Soerens with Kohler et al. to "expand the application of polyethylene glycol as a softener in the design of Vinson"

misconstrues the cited references. Vinson et al. do not teach the use of polyethylene glycol as a softener, but as a plasticizer used only in conjunction with a quaternary ammonium softening active ingredient to reduce the melting point and viscosity of the quaternary ammonium ingredient to aid in the synthesis. By contrast Kohler et al. do not teach the use of quaternary ammonium softening agents and instead use polyethylene glycol as a component of a surface-finishing composition. Thus, the disparate uses of polyethylene glycol in these two references would not suggest one skilled in the art to combine their teachings. In view of the above, Applicants respectfully submit that a *prima facie* case of obviousness is lacking with respect to claim 13.

Claims 14-16 and 24 depend from claim 13 and likewise are submitted as patentable over Vinson et al. in view of Soerens and further in view of Kohler et al. for the same reasons as claim 13 set forth above, as well as for the additional elements they require.

3. Rejection of Claims 6-7 Under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 6-7 under 35 U.S.C. §103(a) as being unpatentable over Vinson et al. in view of Soerens and further in view of Ploetz et al. (U.S. 3,779,791).

Claims 6 and 7 depend indirectly from claim 1 and further require that the temperature of heated air passed through the partially dewatered web during the through-air drying step be from about 190°C to about 210°C or from about 200°C to about 205°C. Applicants note that claim 1 has not been rejected under 103(a) over Vinson et al. in view of Soerens and further in view of Ploetz et al. Therefore, claims 6-7, which depend from claim 1, are patentable for the same reasons as claim 1 above. In

particular, the cited art fails to disclose through-air drying the web at a temperature of at least about 175%.

Vinson et al. and Soerens are discussed above.

Ploetz et al. disclose a method that permits heating of **paper products** consisting predominantly or entirely of cellulose (e.g., paper and paperboard) to temperatures well in excess of 100°C, as during dry sterilization, without the paper product becoming brittle or disintegrating. The method includes impregnating the paper product with from 2% to 25% by weight polyethylene glycol prior to heating.

In addition to above, Applicants respectfully point out that the disclosure of Ploetz et al. is limited solely to heat treatment of existing paper products and that the reference makes absolutely no mention of the temperatures at which partially dewatered webs of papermaking fibers are dried during the initial papermaking process, much less through-air drying temperatures. Accordingly, the acknowledged deficiencies of the disclosure in Vinson et al. with respect to the temperature of the air passed through the partially dewatered web as recited in claims 6 and 7 cannot be overcome by resort to Ploetz et al.

In view of the above, Applicants respectfully submit that claims 6 and 7 are patentable over Vinson et al. in view of Soerens and further in view of Ploetz et al.

4. Rejection of Claims 17-21 Under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 17-21 under 35 U.S.C. §103(a) as being unpatentable over Vinson et al. in view of Soerens and Kohler et al. and further in view of Ploetz et al.

Claims 17-19 depend indirectly from claim 13 and further require that the partially dewatered web be through-air dried by passing heated air at a temperature of at least about 190°C, from

about 190°C to about 210°C or from about 200°C to about 205°C through the web. Applicants note that claim 13 has not been rejected under 103(a) over Vinson et al. in view of Soerens and Kohler et al. and further in view of Ploetz et al. Therefore, claims 17-21, which depend from claim 13, are patentable for the same reasons as claim 13 above. In particular, the cited art fails to disclose a process for manufacturing a cellulosic paper product comprising the step of typically applying polyethylene glycol in an amount of from about 0.5% to about 20% by weight of the papermaking fibers in the web.

The references are discussed above. As noted above, the Vinson et al., Soerens, and Kohler et al. references do not mention through-air drying at a temperature of at least about 190°C, from about 190°C to about 210°C or from about 200°C to about 205°C. Ploetz et al. disclose nothing regarding drying partially dewatered webs during the papermaking process. Accordingly, the admitted deficiencies in the disclosure of Vinson et al. with respect to claims 17-19 cannot be overcome by resort to the secondary references.

Claims 20 and 21 depend indirectly from claim 13 and are submitted as patentable over the combination of Vinson et al., Soerens, Kohler et al. and Ploetz et al. for the reasons set forth above with respect to claim 13.

Conclusion

In view of the above, Applicants respectfully request favorable reconsideration and allowance of all pending claims. The Commissioner is hereby authorized to charge any fee deficiency in connection with this Letter To Patent and Trademark Office to Deposit Account Number 19-1345 in the name of Senniger, Powers, Leavitt & Roedel.

KCC 4779 (K.C. No. 17,026)
PATENT

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